Throughout the Mediterranean basin many local winds occur; generally each has been given a local name. Many of these local winds, however, are generated by the same physical effects. The diurnal temperature cycle is responsible for the land and sea breeze regimes as well as the mountain and valley winds. On a typical day, a horizontal temperature gradient is established by the differential heating between the land and sea or the mountains and valleys, thereby generating a local wind. During the diurnal cycle, the horizontal temperature gradient will reverse sign, with a subsequent reversal of wind direction. Along coast lines,incoming solar radiation (insolation) heats the land surface faster than the sea, while at night, the sea cools at a slower rate than the land due to its greater heat capacity. Therefore, during the day, the warmer less dense air is over land, and the cooler more dense air over the water. A circulation pattern is established as the warm air rises over land and the air sinks over water. At the low levels this causes the cooler air to replace the warm air, whereas aloft, the reverse is true, thereby completing the circulation loop. At night the earth radiates energy much more rapidly than the water whereby the sea water becomes warmer than the land and the circulation pattern reverses into a land breeze. Similar dynamic effects are responsible for the mountain and valley winds, but generally the physical processes are much more complicated than those which give a sea breeze.

The monthly wind charts in this volume show a relatively high frequency of strong winds occurring over the Gulf of Lion, especially during the winter and spring. This is the result of a wind called the Mistral: a cold dry katabatic (downslope) wind from the north to northwest that is channeled and strengthened (jet effect) between the mountains (the Pyrenees and western Alps) of the lower Rhone Valley. It often exceeds 50 knots, reaching speeds as high as 75 knots in the lower Rhone Valley, but it rarely exceeds 45 knots at the coast. Further decreases in the wind speed occur over the sea to the south, east, and west. These winds can extend as far south as the Spanish border on the west and the Tyrrhenian Sea on the east.

A Foehn wind can generally be found in almost all mountainous regions. The Foehn is a warm, dry downslope wind on the lee side of a mountain range that can often reach fresh gale force (34 knots) or higher strength. The name originated in the Alps, where it is quite prevalent, occurring mostly with a southerly wind. It is most noted for descending the northern face of a mountain range into a north-south valley that opens onto a plain, or an east-west cross valley, such as at Innsbruck (Austria). On the windward side, the ascending air cools at the moist adiabatic rate with condensation and precipitation occurring. On the lee side, the descending air, having lost its moisture, warms at the dry adiabatic rate, reaching the valley as a warm, dry wind. On rare occasions, a "North Foehn" will effect northern Italy, south of the Alps, mostly in the western portions of the Po Valley. This occurs in combination with a high pressure system north of the Alps and low pressure over northern Italy. East of this region, over the Adriatic Sea and Balkans, the significant local wind is known as the Bora. It is a fall katabatic wind of such cold origin that when it descends the relatively short topographic slope of the Dinaric Alps, the dynamic warming is insufficient and the wind reaches the warm plains or coastal region significantly colder than the environment. The Bora wind is most prominent along the eastern shores of the Adriatic Sea, where wind speeds at Trieste (Italy) have averaged over 70 knots, with gusts exceeding 110 knots. In addition to the strong winds, temperatures have fallen to as low as 14$^{o}$F and relative humidities to as little as 15 percent.

The Bora winds, when associated only with a high pressure system over central Europe and no opposing low to the south, will generally not extend far out to sea. However, where an opposing low pressure does exist to the south, such as one producing a warm Sirocco (or Scirocco-a Foehn type wind defined below), the warm southerly wind will generally rise aloft over the Bora, producing cloudy skies and some precipitation. Under these circumstances, the Bora winds will most likely extend out over the entire Adriatic Sea. The term Bora also applies to winds of similar origin that are observed at Novorossiysk (U.S.S.R.) on the northern shores of the Black Sea.

As depressions move from west to east across the southern Mediterranean Sea or North Africa, they produce the warm southerly or southeasterly wind in advance of their movement known as the Sirocco. This source of air comes from the Sahara and, as a desert wind, it is dry and often laden with sand and dust. Additional warming occurs through adiabatic compression as the air descends from the desert plateau to the Mediterranean coast. As the Sirocco crosses the Mediterranean Sea, the air picks up moisture and reaches Malta, Sicily, Italy and other parts of the European Mediterranean coast as a warm, moisture-laden wind. Across the Mediterranean basin, the Sirocco is known by many names; in Egypt and over the Red Sea, it is called Khamsin; in the coastal plains of Libya, as Ghibli; in Syria and the deserts of Arabia, as Simoom (poison wind); and along the southeast coast of Spain, as Solano or Leveche. These are only a few of the local names and spellings used to describe wind of desert origin. For more about the local winds of the Mediterranean basin reference Reiter (1975).